THE UNIVERSITY of EDINBURGH

Edinburgh Research Explorer

The economic impact of the tourism moratoria in the Canary Islands 2003-2017

Citation for published version:
Inchausti-Sintes, F & Voltes-Dorta, A 2019, 'The economic impact of the tourism moratoria in the Canary Islands 2003-2017', *Journal of Sustainable Tourism*. https://doi.org/10.1080/09669582.2019.1677677

Digital Object Identifier (DOI):
10.1080/09669582.2019.1677677

Link:
Link to publication record in Edinburgh Research Explorer

Document Version:
Peer reviewed version

Published In:
Journal of Sustainable Tourism

Publisher Rights Statement:
This is an Accepted Manuscript of an article published by Taylor & Francis in Journal of Sustainable Tourism on 21 Oct 2019, available online: https://www.tandfonline.com/doi/full/10.1080/09669582.2019.1677677.

General rights
Copyright for the publications made accessible via the Edinburgh Research Explorer is retained by the author(s) and / or other copyright owners and it is a condition of accessing these publications that users recognise and abide by the legal requirements associated with these rights.

Take down policy
The University of Edinburgh has made every reasonable effort to ensure that Edinburgh Research Explorer content complies with UK legislation. If you believe that the public display of this file breaches copyright please contact openaccess@ed.ac.uk providing details, and we will remove access to the work immediately and investigate your claim.

OPEN ACCESS

Download date: 05. May. 2023

THE ECONOMIC IMPACT OF THE TOURISM MORATORIA IN THE CANARY ISLANDS 2003-2017

ABSTRACT

In the early 2000s, the Parliament of the Canary Islands passed a series of tourism moratoria to restrict the growth in tourism supply. Even though the effects of moratoria have been covered in the literature, there is little quantitative evidence about their economic impact on the destinations, particularly in relation to the goal of increasing the quality of the accommodation supply. In order to fill this gap, this paper employs both regression and computable general equilibrium (CGE) methods to estimate the economic impact of the increased 5-star capacity acquired by the Canary Islands during the three moratoria periods between 2003 and 2017. The regression results show that the successive moratoria had a significant impact on the 5-star hotel supply in the Islands, while the CGE model translates the extra capacity into a positive impact on social welfare, with output increases in the sectors that complement tourism activity.

Keywords: Sustainable tourism, mature destinations, tourism moratoria, dynamic computable general equilibrium, difference-in-differences analysis.

1. INTRODUCTION

After a long process that started in the late 1990s, the Parliament of the Canary Islands finally approved their Tourism Development Directives in 2003, which were accompanied by the imposition of temporary restrictions on the development on new tourism accommodation (commonly known as a tourism moratorium). These regulations appeared in a context of uncontrolled growth in tourism supply, fuelled by a construction bubble, that coincided with a period in which the major inbound markets in the United Kingdom, Germany, and the Nordic countries entered a phase of stagnation (Villar-Rojas, 2009). Tourism moratoria typically include exceptions that allow authorities to grant construction licenses to high-quality hotels as well as to incentivise hotel companies to invest in innovation and rejuvenation of the available infrastructure (Hernández-Martín, Álvarez-Albelo & Padrón-Fumero, 2015). These exceptions have been progressively expanded in successive amendments to the initial Canarian moratoria. As a result, the Canarian law is not a unified legal body, but it is comprised of several laws. Simancas-Cruz (2015) justifies said exceptions in the Canarian case, noting that these laws have failed in limiting the use of land, one of the main aims pursued by the moratoria, but, on the other hand, they have effectively restricted the growth of tourism supply in the Islands and also led to upgrades in the quality of accomodation. While these policies may allow the destination to appeal to high-end visitors and increase tourism receipts, authors have also commented on the threats posed by regulatory capture and reduced competition linked to increased entry barriers (Bianchi, 2004).

The need for higher quality and rejuvenation in tourism-based regions can be also supported and understood from a more general economic perspective. The lower productivity gains attained in services-based activities compared with industrial activities (Fixler & Siegel, 1999; Acelus & Arozena, 1999; or Nordhaus, 2001) represents a matter of concern for any tourism-led economy. Developed economies tend to focus on more productive activities, those that generate higher value added and can sustain higher salaries when the economy grows (Hausmann, Hwang & Rodrick, 2007; Cherif & Hasanov, 2014; Jarreau & Poncet, 2012; or Papageorgiou & Spatafora, 2012). Moreover, these economies also experience a higher export income elasticity (above one) than those of developing economies (Bahmani-Oskooee & Kara, 2005). On the contrary, such sectoral transitions are severely capped in tourism-led economies where services represent the largest share of the GDP and the industrial sector accounts only for a marginal weight. As a consequence, quality improvements become a key economic policy to ensure the sustainability and long-term growth of current and future tourist destinations (Capó, Riera & Rosselló, 2007; and Inchausti-Sintes, 2019). The historically high income elasticity of tourism (Algieri & Kanellopoulou, 2009; Falk, 2014; Witt & Martin, 1987; Song, Romilly & Liu, 2000; Untong, Ramos, Kaosa-Ard & Rey-Maquieira, 2015) provides a suitable context for quality improvement and value-added gains in tourism-led regions.

Past studies on the Canary Islands' tourism moratoria have been largely descriptive (e.g. Bianchi, 2004; Hernández-Martín et al., 2015) and offer many consistent views on the positive and negative aspects of restricting tourism supply. However, there is little quantitative evidence in the literature about the overall economic impact on the destinations, particularly in relation to one of its main goals: to rejuvenate and increase the quality of the accommodation supply. Authors like Dwyer, Forsyth and Spurr (2004) recommend a computable general equilibrium (CGE) model to evaluate how the restrictions and incentives on the development of tourism accommodation can affect the allocation of resources, the level of employment, or, as noted by Hernández-Martín et al. (2015), the development of complementary tourism services.

In order to fill this gap, this paper employs both panel-data linear regression and computable general equilibrium (CGE) methods to estimate the economic impact of the increased 5-star capacity acquired by the Canary Islands during the successive moratoria period between 2003 and 2017. A dataset of annual tourism capacity per hotel category was collected from official sources, including the two Canarian provinces of Las Palmas and Santa Cruz de Tenerife, which are benchmarked against other Mediterranean coastal provinces in Spain.

The remainder of this paper is structured as follows: Section 2 provides a literature review on the economic effects of tourism moratoria and the applications of CGE in the area of tourism. Section 3 presents the Canary Islands' case study, covers the process of data collection and processing, as well as the regression and CGE approaches. Section 4 presents the results and discusses their main implications. Section 5 concludes with a summary of the main findings.

2. LITERATURE REVIEW

2.1 Tourism moratoria

The use of public resources (such as natural parks, lakes or beaches) in the provision of tourist services can be linked to over-exploitation and congestion (Hillery, Nancarrow, Griffin & Syme, 2001), which threaten the destinations' natural environment and, in a sort of vicious cycle, can also reduce the value that visitors place on the natural resources (Lukashina, Amirkhanov, Anisimov & Trunev, 1996). Thus, environmental degradation can also threaten the long-term sustainability of economic activity in places that are highly dependent on tourism (Hernández-Martín et al., 2015). These problems are most relevant when the destination specializes in mass tourism, which typically depends on large infrastructure to be located relatively close to the target natural resource, as visitors value comfort and accessibility above other aspects (Hernández & León, 2007). In order to ensure the long-term sustainability of tourism, the rate of regeneration of the natural resource needs to be higher than the social discount rate (Hernández & León, 2013). There are several policy instruments that can be used to work towards that goal. Since congestion can be linked to the number of incoming visitors, the introduction of tourism taxes has been a popular policy among local authorities, as it can lead to a rationalization of demand (due to the internalization of the negative congestion externalities) and the generation of additional revenue to invest in the preservation of local tourism resources (Palmer & Riera, 2003). On the one hand, tourist taxes can be an efficient source of revenue, since they shift the tax burden away from locals and the tourists are made to bear the associated welfare loss (Gooroochurn and Sinclair, 2005). On the other hand, if visitors have a high price sensitivity, tourist taxes can have a negative impact on demand and revenues (Durbarry, 2008).

An alternative policy instrument is the introduction of restrictions on the growth of the accommodation supply (Pintassilgo & Silva, 2007), which are typically temporary and become part of a broader piece of regulation referred to as tourism moratoria. These restrictions can serve to rationalize supply in a context of conflicting trends in three key areas: 1) inbound visitor markets reaching maturity (Baez-García, Flores-Muñoz & Gutiérrez-Barroso, 2018), 2) strong growth in new tourism capacity supported by a very energic construction sector (possibly in the midst of a construction bubble), and 3) increasing political concern about the environmental impact of tourism activity (Millares-i-García, 2016). The cases of Cyprus and the Canary Islands are commonly cited examples of tourism moratoria that match these background conditions (Hernández-Martín et al., 2015). Besides controlling supply, authorities also aim to improve the quality of the available infrastructure to become a more competitive destination and attract a new segment of high-expenditure visitors, thus also increasing the productivity of the tourism sector (Sharpley, 2003). Thus, moratoria typically include exceptions and other incentives for construction licenses of new high-end accommodation facilities (Chapman & Speake, 2011) or the renewal of existing facilities to increase their rating (e.g. hotel stars).

The need for regulatory intervention arises from the fact that the natural dynamics of innovation in accommodation markets may drive a wedge between the objectives of the private companies in the hospitality sector and those of the overall destination. These dynamics can be linked to 1) the principles of Schumpeterian economics, which state that the possession of market power has a positive impact on the ability to innovate (due to extraordinary profits), yet the incentives to actually invest in innovation are stronger in competitive markets (since the potential rewards of differentiating from the competitors are higher) (Church & Ware, 2000), and 2) the existence of horizontal service externalities in the accommodation sector, which means that non-innovating companies can free-ride on the investments made by others that increase the value visitors place on the overall destination (Hjalager, 2002). Thus, a mature destination with an outdated accommodation supply will not naturally attract any investment in innovation as the incumbents will not have the necessary profits to fund it (low-quality facilities attract low-end customers and lack of differentiation leads to strong competition) and any incentives to invest in quality will be diluted by the free-riding problem described above. In this context, Hernández-Martín et al. (2015) note how a tourism moratorium can stop these vicious dynamics by limiting competition, as long as provisions are also made to promote innovation. The authors also note that incumbents may engage in counterproductive practices in the period leading to the moratorium entering into force, with a strong surge in applications for construction licenses that worsens the excess capacity problem and limits the resources available for renovation projects. Villar-Rojas (2009) also notes that firms may switch to long-term residential markets to bypass the regulatory restrictions. This residential use implies a less efficient use of public resources (e.g. coastal areas), since it does not have the same impact on local employment, generates less tax revenues (Rodríguez, 2004), and can even serve as front for illegal tourism accommodation (Hernández-Martín et al., 2015), particularly in the current context of strong development of "sharing economy" platforms, such as Airbnb.

In spite of the well-documented positive and negative aspects of tourism moratoria, there is little quantitative evidence in the literature about their overall economic impact on tourism destinations. In the case of the Canary Islands, the available studies are largely descriptive (e.g. Bianchi, 2004; Villar-Rojas, 2009; Rodríguez, 2014; Hernández-Martín et al., 2015; and Parreño-Castellano, González-Morales & Hernández-Luis, 2018), yet some authors (Bianchi, 2004) deliver strong conclusions about the threats posed by regulatory capture and the lobbying efforts by dominant players in the hospitality sector that seek to reap the benefits from increased concentration linked to entry barriers. Despite the potential benefits of targeting new inbound markets, the overall goal of investing in innovation to improve the quality of the accommodation supply must be consistent, at least in the short term, with the destination's established market focus, which is typically mass tourism (Farsari, Butler & Prastacos, 2007). In the case of Cyprus, Sharpley (2003) notes how the moratoria failed to transform the destination into a higher-quality and more sustainable tourism product, given the mismatch between that goal and the persistent focus towards mass tourism that kept driving the sector.

In this context, there is a gap in the literature for quantitative studies about the economic impact of tourism moratoria in the regions that have implemented them. As noted by Dwyer et al. (2004), a general equilibrium approach would be the right methodology to evaluate how the restrictions and incentives on the development of tourism accommodation can affect the overall allocation of resources in the local economies. Hernández-Martín et al. (2015) expanded on that idea to note the three main areas of impact: 1) rationalization of the tourism sector (which can free economic resources for other sectors), 2) impact on employment and income distribution (with a reduction of supply that can also lower wages), and 3) development of complementary tourism services, as a result of the higher-quality market focus that attracts price-inelastic visitors willing to spend more in food, shopping or leisure activities. The effects can be captured by a dynamic computable general equilibrium (CGE) model.

CGE contributions in this area most often conclude that tourism improves social welfare (Copeland, 1991; Blake et al., 2006; Blake, 2000; Hazari & Sgro, 2004) and relieves poverty and/or inequality (Blake, Arbache, Sinclair, & Teles, 2008; Wattanakuljarus & Coxhead, 2008; Pratt, 2014; Njoya & Seetaram, 2018; Gatti, 2013). Nevertheless, tourism also comes with some sectoral consequences to be addressed. The two most important are: the appreciation of the real exchange rate and the rise in demand for non-tradable goods (Copeland, 1991; Chao, Hazari, Laffargue, Sgro & Yu, 2006). The former erodes traditional exports, while imports become cheaper. The latter implies a shift of resources from tradable to non-tradable sectors, eroding their competitiveness and productivity. This can hamper growth when sectors experience economies of scale (Copeland, 1991). Moreover, both effects may also be a symptom of a more severe economic consequence known as the "*Dutch Disease*" (Corden & Neary, 1982; Corden, 1984), which is known to affect tourism sectors (Nowak & Sahli, 2007; Chao et al., 2006; and Inchausti-Sintes, 2015).

3. DATA AND METHODOLOGY

3.1 Case study and datasets

The moratorium on tourism accommodation in the Canary Islands can be traced back to the late 1990s, when the accelerated growth in the construction of new hotels and tourism beds contrasted with the maturity of the Islands' inbound markets, such as the United Kingdom, Germany, or the Nordic Countries (Hernández-Martín et al., 2015). This prompted the regional government to approve legislation to restrict the construction of any new accommodation supply with the objectives to preserve the islands' natural resources and use it as an instrument of strategic planning at a regional level, with the underlying goal of improving the quality of accommodation establishments (Álvarez-Moleiro, 2015).

To date, three different moratoria regulations have been established in the Canary Islands, though the chronology of events allows us to define five stages in their implementation (Garzón, 2013):

0) Suspended moratorium (January 2001 to April 2003): the original decrees from the regional Government aimed to paralyze all construction licenses with few exceptions, such as a) those for new hotels that represented a "substantial qualitative increase in the tourism supply", b) for rehabilitation projects to increase the category of any establishment without increasing its supply of beds, and c) for construction or rehabilitation projects in "consolidated urban land" with the objective to expand the supply of urban tourism establishments. These decrees were all suspended by the High Court, until a law was finally passed in April 2003.

1a) First moratorium (April 2003-April 2006): the law 19/2003, which contained the new Tourism Directive of the Canary Islands, contained essentially the same provisions of the previously suspended decrees. Higher-quality hotels of "exceptional" nature were still exempted from the moratorium, provided they were deemed as beneficial to public interest by the Regional Parliament.

1b) Extension of the first moratorium (April 2006-May 2009): In spite of the need to approve a new law within three years from the publication of the previous one, the lack of political consensus led to an extension of the provisions of the first moratorium that ended up lasting for another three years.

2) Second Moratorium with extension (May 2009-May 2013): The new law (6/2009) relaxed the restrictions on hotels with a category of 5-star "grand luxury" that also doubled as "hotel-school" (*hotel escuela*) for the training of personnel. It also provided incentives (within the first two years of the new law) for hotels to either be demolished and moved to superior locations, or, in the case of refurbishment and upgrades, the hotels were allowed small increases in their bed supply.

3) Third moratorium (May 2013-present): the current law (2/2013), amongst other things, further relaxed the concession of construction licenses for "regular" 5-star hotels.

These regulations apply to the entire Autonomous Community of the Canary Islands, which is split into two provinces: the Province of Las Palmas comprises the eastern islands of Gran Canaria, Fuerteventura, and Lanzarote; while the Province of Santa Cruz de Tenerife comprises the western islands of Tenerife, La Palma, La Gomera, and El Hierro. Despite the common rules, it is worth noting that construction licenses had to be first authorized by the islands' own governments (Cabildos). Furthermore, other political, socio-economic, and geographical differences across islands beg the question on whether the moratorium had an uniform impact across the region.

As a proxy for the overall supply of high-quality accommodation, the evolution in the number of 5-star hotel beds in the two provinces of the Canary Islands, in comparison with the other Spanish provinces, is shown in Figure 1. Before the first moratorium, the annual 5-star accommodation offering (calculated by aggregating the monthly supply reported by the Spanish National Statistics Institute - INE) was steady around 40,000 beds in both Canarian provinces and similar, in size, to the supply in the Mediterranean provinces of Málaga and Barcelona. After the first law was approved, the supply of 5-star beds steadily increased in Tenerife, while Las Palmas suddenly caught up with the western province in 2006 at a level of supply that doubled the one existing five years ago (by far the largest in Spain, which is consistent with the Canaries being a "year-round destination", as opposed to the extreme annual seasonality of other regions like the Balearic Islands). This sharp increase in 5-star hotel capacity observed in Las Palmas can be related to the "boom" of applications for construction licenses before the first moratorium entered into force, which created a large stock of hotel capacity "in progress" that abruptly entered the market in 2006 (González & Turégano, 2012). Furthermore, this first period of development coincided with the boom of the construction sector in Spain that also led to a substantial increase in income and population in the Canaries (Garzón, 2013). Over the successive periods, the development trend was the same, with Tenerife leading the growth and Las Palmas eventually catching up. This explosive and steady growth has only been matched by the Balearic Islands, which had their own regulations in place since the 80s with similar provisions about the development of high-quality establishments and the barriers to low-quality ones (Rullán-Salamanca, 2010). Finally, it is worth mentioning the decrease in the hotel supply in the province of Málaga, which is due to an increasing proportion of hoteliers deciding to close their establishments during off-peak season, thus effectively reducing the annual hotel supply (Montero, 2011).

[Figure 1]

3.2 Panel data regression

The first methodological stage is a regression analysis. A balanced panel dataset of 266 observations was obtained. This includes a cross-section of 14 Spanish provinces over 19 years (1999-2017). Even though the information was readily available for all 50 provinces and the 2 autonomous cities in Spain, only Mediterranean coastal provinces were included in the sample alongside the Canaries to keep some degree of comparability in regard to the sun-and-beach tourism profile (i.e. Alicante, Almería, Barcelona, Cádiz, Castellón, Girona, Granada, Huelva[1], Malaga, Murcia, Las Palmas, Santa Cruz de Tenerife, Tarragona and Valencia).

Our basic specification is shown in Equation 1:

(1) $$beds5star_{it} = \beta_0 + \beta_1 mor1\_LPA + \beta_2 mor2\_LPA + \beta_3 mor3\_LPA + \beta_4 mor1\_SCTFE + \beta_5 mor2\_SCTFE + \beta_6 mor3\_SCTFE + \beta_7 CPI + \beta_8 kmcoast + \sum_i \beta_i province_i + \sum_t \beta_t year_t + u_{it}$$

(2) $$u_{it} = v_i + \varepsilon_{it}$$

where *i=(1,…,14)* denotes a province and *t=(1,…,19)* refers to a year. The usual random error is denoted by ε, and β refers to the vector of coefficients to be estimated. Finally, u_i denotes the error disturbance which, in panel data, is disentangled into an unobservable individual specific effect (v_i) and the rest of the disturbance (ε_{it}). The results of a Hausman test support the use of random effects (4.52, p-value<0.21), which is the approach we employ here.

The dependent variable is the annual 5-star beds measured for province *i* in year *t* ($beds5stars_{it}$). As right-hand side variables, we include six interaction dummy variables (i.e. treatments) to measure the impact of the different tourism moratoria in the two Canarian provinces (first moratorium with extension: 2003-2008, second: 2009-2012, and third: 2013-2017). The abbreviations *LPA* and *SCTFE* refer to the provinces of Las Palmas and Santa Cruz de Tenerife, respectively. Thus, *mor1_LPA* denotes the treatment effect of the first moratorium in Las Palmas. The meaning of the remaining labels for the treatment effects can be deduced by analogy. The inclusion of these dummy variables allows us to conduct a difference-in-differences (DID) analysis (Angrist & Pischke, 2009; Imbens & Wooldridge, 2009). Figure 2 shows the kind of effect captured by this approach. The moratoria (treatment) implies an upward shift in the supply of 5-star beds in both Canarian provinces (treatment units), with respect to an estimated counterfactual obtained from the data that includes the control

[1] Huelva is located west of the Strait of Gibraltar, thus facing the Atlantic Ocean, and does not strictly have a Mediterranean coastline. However, it is considered comparable to the other coastal provinces in Andalusia.

provinces. A key requirement of the DID method is the parallel trend assumption, by which we do not omit any variable that changed in the Canaries but not in the rest of Spain at the same time as the treatment. This justifies removing the Balearics from the control sample because this province has had a tourism moratorium in place since 1999, which explains the different trend (Figure 1). Further support for the parallel-trend assumption can be seen in Figure 1 for the pre-treatment period, when the 5-star tourism supply in the Canaries had the same level and trend than other Mediterranean provinces.

[Figure 2]

We also include the local consumer price index (*CPI*) as a proxy variable for hotel prices. This can be linked to the theoretical framework of hotel room supply developed by Borooah (1999), in which supply decisions for guest rooms are made with respect to producer prices that represent the earnings per available room. While producer prices are not observable to us, we employ consumer prices instead as their variability can be expected to match that of average labor costs in the different provinces, which, in turn, can ultimately be linked to changes in average room rates, as noted by Qu, Xu, & Tan (2002). Even though all the sample provinces are coastal, the length of coastline in km (*kmcoast*) can also be a key differentiating factor of tourism supply across them. This is because hotels located in coastal areas have been shown to offer higher prices and enjoy increased profitability (Sami and Mohammed, 2014). The specification is completed with dummy variables for year and province that aim to capture the overall trend of tourism development in Spain, as well as additional non-observable heterogeneity across the sample provinces, in accordance with the view that tourism markets present differences at a sub-national level (Clewer, Pack & Sinclair, 1990). The descriptive statistics for the continuous variables are shown in Table 1. All variables are sourced from INE, the Spanish National Statistics Institute.

[Table 1]

After the regression coefficients have been obtained, the predicted increase in the number of 5-star hotel beds in each moratoria period will be converted to a shock in the 5-star tourism demand using data on average occupancy rates. These estimates are then brought forward to a dynamic CGE model in order to determine their impacts in the regional economy.

3.3 Dynamic Computable general equilibrium model

The dynamic CGE model is calibrated according to the Canarian Input-Output Tables (IOTs) elaborated by the Canarian Statistical Institute (ISTAC). The most recently available tables correspond to 2005. However, we do not consider this a fatal flaw after investigating the evolution of sectoral shares in the Canaries between 2005 and 2017. Despite some fluctuations over the period, the overall economic structure of the Canaries has not changed significantly, especially in the sectors that relate to tourism activity, such as trade, accommodation, catering, or entertainment. The model has been programmed in the software GAMS using the mathematical programming system for general equilibrium (MPSGE) (Rutherford, 1999). The Canarian model assumes a small open economy with perfect factor mobility, competitive markets, flexible prices, nineteen sectors and goods, one government, one representative household and the elasticities have been taken from Hertel (1998)[2]. The main equation of the Canarian CGE model can be summarized as follows:

[2] The elasticities are shown in Annex I

(3) $A_{i,t} = \gamma \left(\chi_i D_{i,t}^{1-\frac{1}{\sigma_{dm}}} + (1-\chi_i) M_{i,t}^{1-\frac{1}{\sigma_{dm}}} \right)^{\frac{1}{\sigma_{dm}-1}}$

The model assumes imperfect substitution between domestic and import goods (Armington, 1969). Subscripts i and t refer to commodities and time, respectively. Both imports ($M_{i,t}$) and domestic goods ($D_{i,t}$) are combined in i composite goods in time t (referred to as Armington goods - $A_{i,t}$) to be either consumed by the representative household, the government, or devoted to investment which, at the same time, is demanded by the representative household and the government. Such aggregation is carried out according to a constant elasticity of substtution (CES) function (Equation 3), where γ, χ_i and σ_{dm} denote the scale parameter, the value share of domestic goods and the elasticity of substitution of domestic and imported products, respectively. When the Armington goods are demanded as intermediate goods, they are transformed according to a nested production function (Equations 4 and 5). In the first nest, capital ($K_{a,t}$) and labour ($L_{a,t}$) are demanded by each activity (a_t) according to a CES function to form a composite good (va_a). η, ϕ and ρ denote the scale parameter, the value share of capital and the elasticity of substitution by activities, respectively. In the other nest, intermediate goods are demanded according to fixed coefficients (Leontief). In the second nest, va_a is combined with the intermediate demand ($id_{i,a,t}$) according to a Leontief production function to determine the total production by activities ($actv_{a,t}$). Intermediate demands are fixed-coefficient (Leontief) multiples of total output

(4) $actv_{a,t} = min \left\{ \min \frac{id_{i,a,t}}{\beta_{i,a,t}}, \frac{va_{a,t}}{\alpha_a} \right\}$

(5) $va_{a,t} = \eta_a \left(\phi_a K_{a,t}{}^{\rho} + (1-\phi_a) L_{a,t}{}^{\rho} \right)^{\frac{1}{\rho}}$ being $\rho = \frac{\sigma_{va}-1}{\sigma_{va}}$

The production by activities is disentangled into domestic ($D_{i,t}$) and export goods ($X_{i,t}$) according to a CES transformation (equation 6), but where the production by activities ($actv_{a,t}$) is first aggregated by commodities according to the following equation: $Y_{i,t} = \sum_a \psi_{i,a} actv_{a,t}$, where $\psi_{i,a}$ represents the value share by goods and activities. ε_i, δ_i and T denote the scale parameter, the value share of domestic goods and the elasticity of transformation between domestic and export goods, respectively.

(6) $Y_{i,t} = \varepsilon_i \left(\delta_i D_{i,t}{}^{(1+T)} + (1-\delta_i) X_{i,t}{}^{(1+T)} \right)^{\frac{1}{T}}$

Armington goods ($A_{i,t}$) can be also demanded by the representative household (H_t) and the government (G_t) as final goods (final consumption and investment). Both final agents take their optimal investment and consumption decisions while constrained by their respective endowments: capital ($\overline{K_{H,t}}$), labour ($\overline{L_t}$), and the current account deficit ($\overline{CC_t}$) in the case of the household ($H_t = r_t K_{H,t} + w_t \overline{L}_t + e_t \overline{CC}$) and capital and taxes in the case of the government ($G_t = r_t \overline{K_t} + taxes_t$). Thus, the total capital endowment is $K_t = K_{H,t} + K_{G,t}$; and w_t, r_t and e_t are the salaries, price of capital and real exchange rate, respectively. Labour and capital are demanded by the economic activities such that $\overline{L_t} = \sum_a L_{a,t}$ and $K_t = \sum_a K_{a,t}$ which generate income for both agents. The sectoral demand of both factors is defined as follows:

(7) $K_{a,t} = \eta_a{}^{\sigma_{va}-1} \left(\frac{(1-\phi_a) P_{a,t}}{r_t} \right)^{\sigma_{va}} actv_{a,t}$

(8) $L_{a,t} = \eta_a{}^{\sigma_{va}-1} \left(\frac{\phi_a P_{a,t}}{w_t} \right)^{\sigma_{va}} actv_{a,t}$

The demand for goods and investment of the representative household and the government (CES demand functions) is defined as follows:

(9) $$C_{i,t}^{H} = \upsilon_i{}^{\sigma_h - 1}\left(\frac{\lambda_i P_{i,t}}{P_{cpi,t}}\right)^{\sigma_h} H_t$$

(10) $$C_{i,t}^{G} = \tau_i{}^{\sigma_g - 1}\left(\frac{\kappa_i P_{i,t}}{P_{g,t}}\right)^{\sigma_g} G_t$$

(11) $$Inv_t^{H} = \iota^{\sigma_h - 1}\left(\frac{\varsigma Pinv_{,t}}{P_{cpi,t}}\right)^{\sigma_h} H_t$$

(12) $$Inv_t^{G} = \omega^{\sigma_g - 1}\left(\frac{\zeta Pinv_{,t}}{P_{g,t}}\right)^{\sigma_g} G_t$$

Where $C_{i,t}^{H}$, $C_{i,t}^{G}$, Inv_t^{H} and Inv_t^{G} refer to the bundle of goods and services demanded by the representative household, the government, and the total investment accrued by the representative household and the government, respectively. Each of these demands are derived from a maximization problem where υ_i, τ_i, ι and ω are the scale parameters; λ_i κ_i, ς and ζ denote the respective values shares; $P_{i,t}$, $P_{cpi,t}$, $Pinv_t$ and $P_{G,t}$ denote the final prices of goods and services, the consumer price index, the price of investment and the price of government, repectively. σ_h and σ_g refer to the elasticities of substitution for households and the government, respectively. Note that, in regards to the underlying utlility maximization processes, both the government and the representative household possess a backward-looking behaviour. Finally, the following identities also hold, $H_t = Inv_t^H + C_t^H$; being $C_t^H = \sum_i C_{i,t}^H$ and $G_t = Inv_t^G + C_t^G$; being $C_t^G = \sum_i C_{i,t}^G$ such that the income balance constraints are met.

In line with the objectives of this research, we consider two additional agents in this economy: general tourists and those who stay in 5-star hotels. Both demand goods and services according to the following CES functions:

(13) $$C_{i,t}^{tour} = \varpi_i{}^{\sigma_{tour}-1}\left(\frac{\theta_i P_{i,t}}{e_t}\right)^{\sigma_{tour}} tourism_t$$

(14) $$C_{i,t}^{tour5*} = \pi_i{}^{\sigma_{tour}-1}\left(\frac{\varphi_i P_{i,t}}{e_t}\right)^{\sigma_{tour}} tourism_t^{5*}$$

These functions are derived from the respective consumer utility maximization problems with backward-looking behaviour. The income balance constraint of both types of tourists is their expenditure level denoted by $tourism_t$ and $tourism_t^{5*}$ for the general tourists and 5-star tourists, respectively. $C_{i,t}^{tour}$ and $C_{i,t}^{tour5*}$ denote the bundle of goods and services consumed by general tourists and 5-star tourists, respectively. ϖ_i and π_i denote their own scale parameters; θ_i and φ_i refer to the value shares of each good, e represents the real exchange rate and σ_{tou} is the elasticity of substitution that is the same for both types of tourists. The information about tourist profiles is collected from the ISTAC. According to this source, a 5-star tourist spends in accommodation around 1.27 times and 1.5 times more than a 4-star and 3-star tourist, respectively. Overall, their average expenditure is 1.16 times above the average tourist and they represent around 10%-13% of total arrivals to the Canary Islands.

In order to ensure model closure (Hosoe, Gazawa & Hashimoto, 2010), we assume that investment is savings-driven (i.e. saving is fixed), the government equates income with expenditure (i.e. zero deficit), the world prices and foreign savings are fixed, so the exchange rate is flexible to clear the current account. Finally, the model also assumes the existence of unemployment, which is modelled according to the following condition: $w_t = P_{cpi,t}$. This effectively introduces a minimum wage constraint: an unemployed person is willing to work if the real salary index (w_t) compensates, at least, the real consumer price index ($P_{cpi,t}$), used in here as a proxy for the shadow price of labour.

Finally, a dynamic model requires assumptions about the rates of economic growth (eg), the interest rate (ir) and the depreciation of capital (δ) to ensure a steady state. In this sense, the three moratoria periods took place in different economic contexts. The first period (2003-2009) is characterized by steady economic growth. On the contrary, the second moratorium coincides with the advent of the economic crisis triggered in 2008, which led to negative growth and increased the unemployment rate strongly. Finally, the third moratorium took place in a more stable economic environment with modest positive growth, although the unemployment rate remained high. Thus, three dynamic CGE models with three different steady state and unemployment levels are generated for each of the three periods of the moratoria. The real economic growth observed in each of the three periods was 1,72%, -1,72% and 2.43%, respectively. The real interest rate was 1.4%, -0.9% and 0.3%, respectively. The depreciation of capital was 5% for the three periods (Escribá-Pérez, Murgui-García & Ruiz-Tamarit, 2017). The unemployment rate is set at 12%, 28% and 29% for the three periods, respectively (ISTAC). The levels of capital for the government and the household change over time according to the following "*laws of motion*":

$$(15)\; K_{H,t} = (1-\delta)K_{H,t-1} + \overline{gos}_{H,t} + inv_{t-1}\overline{inv}_{H,t}(ir+\delta)$$

$$(16)\; K_{G,t} = (1-\delta)K_{G,t-1} + \overline{gos}_{G,t} + inv_{t-1}\overline{inv}_{G,t=0}(ir+\delta),$$

where $\overline{gos}_{H,t}$ and $\overline{gos}_{G,t}$ denote the gross operating surpluses accrued by households and government, respectively. And, $\overline{inv}_{H,t=0}$ and $\overline{inv}_{G,t=0}$, denote the initial endowment of investment for households and government, respectively.

4. RESULTS AND DISCUSSION

Table 2 shows the estimated coefficients of the random-effects panel-data regression. The Breusch and Pagan Lagrangian multiplier test for random effects conducted prior to the estimation supports the use of panel data over pooled data (1123.85, p-value<0.000). Additionally, the White test rejects the existence of heteroskedasticty in the error term (0.22, p-value<0.80). To conclude, the potential endogeneity of the CPI variable was also statistically tested and rejected (0.218, p-value<0.64).

The equation shows extremely high goodness-of-fit and has overall significance, as per the outcome of the F-test. The signs of the treatment binary variables are the expected ones in view of the trends shown in Figure 1. The effect of the different moratoria on the annual number of 5-star beds in the two Canarian provinces is positive and significant in all cases, ranging between 34 and 124 thousand additional beds. In addition, the impact of the moratoria increases over time, with the current regulations leading to the highest increases in high-quality accommodation supply. This can be clearly linked to the successive moratoria becoming more relaxed in terms in terms of what types of 5-star hotels ("hotel-school", "grand luxury" or "regular") could be built. Table 3 reports the probability values of the pairwise Wald tests of equality of the treatment effects. The results clearly show (with 99% confidence) that the effect of the moratoria changed over time and was different between provinces.

Out of the remaining coefficients, it is worth highlighting the lack of significance of the CPI coefficient[3], as well as the positive impact of the km of coastline, which is an expected result

[3] An alternative specification with lagged CPI did not yield a significant coefficient either.

given the importance of sun-and-beach tourism for Spanish regions. The year dummies establish the overall trend of tourism accommodation in Spain, though none of the individual variables is significant. Most of the province dummies are significant. Las Palmas is the reference category and, as expected, Santa Cruz de Tenerife is not significantly different since these dummies are expected to capture aspects like insularity and regional income. Without the impact of the moratoria, Barcelona would have been the top Spanish province for 5-star accommodation supply.

The next step in the analysis is to estimate the economic impact of the rise in 5-star hotel beds in each period of the moratoria. To that end, three sets of annual shocks in demand have been calculated as follows (see table 4): the annual increase in 5-star beds fostered by the moratoria in each period can be obtained from the coefficients in Table 2 (adding up the coefficients of both provinces). These increments represent a varying percentage of the total 5-star capacity in the islands. Multiplying the percentage increase in 5-star capacity by the occupancy rate (70% according to the ISTAC) we obtain the average annual rise in tourism demand generated by these new beds. These are the annual shocks in demand brought to the CGE modelling.

[Table 2]

[Table 3]

[Table 4]

Table 5 shows the results of the dynamic CGE model. The main conclusion is that the rise in 5-star hotel beds contributes to a modestly positive economic impact in the Canary Islands during the three periods of the *moratoria*. The GDP grows annually, on average, 0.09%, 0.22% and 0.20% for the three periods, respectively. These changes are commensurate with the small share that 5-star tourists represent over the total tourism arrivals to the Islands (around 10-13%). There is also a rise in annual household welfare (measured as Equivalent Variation - EV) of 0.09%, 0.25% and 0.22%, respectively. There is a decrease in total exports that can be explained in two ways. Firstly, the appreciation of the real exchange rate (the archipelago becomes relatively more expensive than the rest of the world) which erodes traditional exports. Secondly, the advent of 5-star tourists crowds out the other tourism segments (i.e. mass tourists) and their economic importance for the islands. In spite of that, the economy benefits from cheaper imports, which, in the case of the Canaries (where imports represent 54% of the GDP) means an economic relief for both firms and households. While the former see lower production costs, the latter also face lower inflation as shown in Table 5. The new tourist flows boosted by the moratoria also help to slightly reduce the high unemployment in the archipelago by 0.13%, 0.3%, 0.25% per year for each period, respectively. In absolute terms, there are, on average, around 160, 960 and 762 more annual jobs in each of the three periods, respectively.

[Table 5]

At the sectoral level (Table 6), all goods and services see their production increase, but, as expected, the tourism-based production such as "processed food, beverage and tobacco", "accommodation", "catering services", "air transport", "travel agencies", "rent a car" or "entertainment" benefit more from the new tourist flows. These tourism-related goods/services show an average annual growth of 0.11%, 0.28% and 0.26% for each period, respectively. However, the rise in the production of non-tourism-based activities contradicts other authors' findings such as Copeland (1991), Chao et al. (2006), Wattanakuljarus & Coxhead (2008), Pratt (2014) or Inchausti-Sintes (2015). Analysing the productive-mix of the Canary Islands, as a tourism-led economy, it shows a marginal weight of the industrial sector. However, and contrary to more diversified economies (Wattanakuljarus & Coxhead, 2008; Pratt, 2014;

Inchausti-Sintes 2015), it is highly oriented toward services, thus allowing for strong linkage effects when tourism rises.

[Table 6]

The same conclusion can be drawn when analysing the employment by sector (Table 7). Tourism-based activities again show the highest increases in employment. Comparing Tables 6 and 7, the rise in employment is, in general, higher than the rise in production. The existence of unemployment pushes salaries down rising labour demand in all sectors. On the contrary, it generates a negative effect on the demand for capital. For instance, while the output of "accommodation" and "travel agencies" rises, on average, 0.05%, 0.11% and 0.11%, the demand for capital drops, on average, 0.06%, 0.20% and 0.13% for each period, respectively. Finally, we also conduct a sensitivity analysis changing key parameters of the model (-70% and +70% of variation) such as the Armington and 5-star tourist elasticities. The average differences in results are 0.001% and -0.001% for a variation of -70% and +70% in these elasticities, respectively. These results support the robustness of the model.

[Table 7]

5. SUMMARY

The imposition of regulatory restrictions to the growth of tourism supply has been a common mechanism of tourism-led economies to ensure sustainable economic development, particularly when tourism activity has an impact on the destination's environmental resources. Even though the expected economic effects of tourism moratoria have been discussed in detail by past authors, there is little quantitative evidence about their actual impact on the destinations, particularly in relation to the goal of increasing the quality of the accommodation supply. In order to fill this gap, this paper employs both panel-data regression and dynamic computable general equilibrium (CGE) methods to estimate the economic impact of the increased 5-star capacity acquired by the Canary Islands during the different periods of the successive moratoria between 2003 and 2017.

In summary, our results show that the successive moratoria led to a significant increase in the 5-star accommodation supply in the Canary Islands, as well as to a modestly positive economic impact in terms of GDP, employment and social welfare. In spite of that, it is worth remembering that the pursuit of higher value-added gains has to coexist with the maintenance and promotion of the environmental attributes, and the rational use of natural resources such as land and water. In addition, there are other underlying economic vulnerabilities identified, such as low productivity and strong dependence on the service sector triggered by tourism, which leave room for further public intervention to ensure a more sustainable tourism development. Therefore, as a body of regulation in constant evolution, future legislation should be adapted to address the challenge of climate change and reinforce sustainability through the circular economy.

Our conclusions should be taken with caution since our approach presents a number of shortcomings. First, the limited time-series dimension of the dataset does not allow for a large number of pre-treatment observations. Second, we employ an outdated input-output table (2005) for the Canary Islands in the CGE model. While this is a common approach in the CGE literature due to data limitations, it can lead to increased quantitative prediction errors. However, Hosoe (2014) concludes that predictions with outdated input-output tables can still be qualitatively correct for decision-making purposes. Third, the availability of data at relatively high level of aggregation (province) does not allow us to isolate the impact of the moratoria for the different tourism hotspots in each island. Further research can tackle these issues as new data becomes available. Finally, our calculations of economic impact do not consider any negative environmental externalities created by the new wave of high-end tourism (and the increase in demand for associated activities) that can offset the positive economic impacts estimated by the CGE model.

REFERENCES

Acelus F.J. & P. Arozena. (1999). Measuring sectoral productivity across time and across countries. *European Journal of Operational Research*, 119(2), 254-266.

Algieri, B., & Kanellopoulou, S. (2009). Determinants of demand for exports of tourism: an unobserved component model. *Tourism and Hospitality Research*, 9(1), 9-19.

Álvarez-Moleiro, J., (2015). Los hoteles de cuatro, cinco y cinco estrellas gran lujo como excepción a la moratoria turística canaria [The four- and five-star hotels as exceptions to the tourism moratorium in the Canary Islands]. *Working Paper*. Universidad de La Laguna.

Angrist, J. D., & Pischke, J. S. (2009). *Mostly harmless econometrics: an empiricist's companion*. Princetown, US: Princetown University Press.

Báez-García, A., Flores-Muñoz, F., & Gutiérrez-Barroso, J. (2018). Maturity in competing tourism destinations: the case of Tenerife. *Tourism Review,* 73(3), 359-373.

Bahmani-Oskooee, M., & Kara, O. (2005). Income and price elasticities of trade: some new estimates. *The International Trade Journal,* 19(2), 165-178.

Bianchi, R. (2004). Tourism restructuring and the politics of sustainability: a critical view from the European periphery (the Canary Islands). *Journal of Sustainable Tourism,* 12(6), 495-529.

Blake, A., Arbache, J. S., Sinclair, M. T., & Teles, V. (2008). Tourism and poverty relief. *Annals of Tourism Research*, 35(1), 107-126.

Blake, A., Durbarry, R., Eugenio-Martin, J. L., Gooroochurn, N., Hay, B., Lennon, J., & Yeoman, I. (2006). Integrating forecasting and CGE models: The case of tourism in Scotland. *Tourism Management*, 27(2), 292-305.

Borooah, V. (1999). The supply of hotel rooms in Queensland, Australia. *Annals of Tourism Research*, 26 (4), 985-1003.

Capó, J., Riera, A., & Rosselló, J. (2007). Dutch Disease in tourism economies: Evidence from the Balearics and the Canary Islands. *Journal of Sustainable Tourism*, 15(6), 615–627.

Chao, C., Hazari, B. R., Laffargue, J. P., Sgro, P. M., & Yu, E. S. (2006). Tourism, Dutch disease and welfare in an open dynamic economy. *The Japanese Economic Review*, 57(4), 501-515.

Chapman, A. & Speake, J. (2011). Regeneration in a mass-tourism resort: The changing fortunes of Bugibba, Malta. *Tourism Management,* 32(3), 482-491.

Cherif, R, & Hasanov, F. (2014). Export sophistication, investment, and growth. *Manuscript submitted for publication.*

Christel DeHaan Tourism and Travel Research Institute (2000). *The economic effects of tourism in Spain*. Notthingham, UK: Blake, A.

Church, J., & Ware, R. (2000). *Industrial Organization: A Strategic Approach (Management & Organizations)*. US: McGraw-Hill.

Clewer, A., Pack, A., & Sinclair, M.T. (1990). Forecasting models for tourism demand in city dominated and coastal areas. *Papers of the Regional Science Association*, 69(1), 31-42.

Copeland, B. R. (1991). Tourism, welfare and de-industrialization in a small open economy. *Economica*, 515-529.

Corden, W. M. (1984). Booming sector and Dutch disease economics: Survey and consolidation. *Oxford Economic Papers*, 36(3), 359–380.

Corden, W. M., & Neary, J. P. (1982). Booming sector and de-industrialization in a small open economy. *The Economic Journal*, 825–848.

Durbarry, R. (2008). Tourism Taxes: Implications for Tourism Demand in the UK. *Review of Development Economics*, 12 (1), 21-36.

Dwyer, L., Forsyth, P. & Spurr, R. (2004). Evaluating tourism's economic effects: New and old approaches. *Tourism Management,* 25(3), 307-317.
Escribá-Pérez, J., Murgui-García, M.J., & Ruiz-Tamarit, J.R. (2017). Medición económica del capital y depreciación endógena: una aplicación a la economía española y sus regions. *Investigaciones regionales- Journal of Regional Research*, 38, 153-180.
Falk, M. (2014). The sensitivity of winter tourism to exchange rate changes: Evidence for the Swiss Alps. *Tourism and Hospitality Research,* 13(2), 101-112.
Farsari, Y., Butler, R., & Prastacos, P. (2007). Sustainable tourism policy for Mediterranean destinations: Issues and interrelationships. *International Journal of Tourism Policy,* 1(1), 58-78.
Fixler D. J., & Siegel, D. (1999). Outsourcing and productivity growth in services. *Structural Change and Economic Dynamics*,10(2), 177-194.
Garzón, A. (2013, june). El ciclo de vida de las tres moratorias canarias [The life cycle of the three moratoria in the Canary Islands]. Retrieved from: https://www.laprovincia.es/blogs/antonio-garzon/el-ciclo-de-vida-de-las-tres-moratorias-canarias.html
Gatti, P. (2013). Tourism, welfare and income distribution: The case of Croatia. *Turizam: međunarodni znanstveno-stručni časopis*, 61(1), 53-71.
González, P. R., & Turégano, M. Á. S. (2012). Los agentes sociales y la política urbanístico-turística: percepción y performatividad. El caso de las Directrices de Ordenación del Territorio y del Turismo de Canarias. *Investigaciones Turísticas*, (3), 56-82.
Gooroochurn, N., & Sinclair, M. T. (2005). Economics of Tourism Taxation: Evidence from Mauritius. *Annals of Tourism Research*, 32(2), 478-498.
Hausmann, R., Hwang, J., & Rodrik, D. (2007). What you export matters. *Journal of economic growth*, 12(1), 1-25.
Hazari, B. R., & Sgro, P. M. (2004). Tourism and growth in a dynamic model of trade. In Tourism, Trade and National Welfare (pp. 185-195). Emerald Group Publishing Limited.
Hernández J., & León, C. (2007). The interactions between natural and physical capitals in the tourist lifecycle model. *Ecological Economics,* 62, 184-193.
Hernández J., & León, C. (2013). Welfare and environmental degradation in a tourism-based economy. *Tourism Economics,* 19 (1), 5–35.
Hernández-Martín, R., Álvarez-Albelo, C., & Padrón-Fumero, N. (2015). The economics and implications of moratoria on tourism accommodation development as a rejuvenation tool in mature tourism destinations. *Journal of Sustainable Tourism,* 23 (6), 881-899.
Hertel, T. W. (1998). In T. W. Hertel (Ed.), *Global trade analysis: modeling and applications*. Cambridge, UK: Cambridge University Press.
Hillery, M., Nancarrow, B., Griffin, G., & Syme, G. (2001). Tourist perception of environmental impact. *Annals of Tourism Research,* 4, 853-867.
Hjalager, A. (2002). Repairing innovation defectiveness in tourism. *Tourism Management* 23(5), 465-474.
Hosoe, N., (2014). Estimation errors in input-output tables and prediction errors in computable general equilibrium analysis. *Economic Modelling*, 42, 277-286.
Hosoe, N., Gasawa, K. & Hashimoto, H. (2010). *Textbook of Computable General Equilibrium Modelling: Programming and Simulations*. Hampshire, UK: Palgrave Macmillan.
Imbens, G. W. & Wooldridge, J. M. (2009). Recent Developments in the Econometrics of Program Evaluation. *Journal of Economic Literature*, 47 (1), 5–86.
Inchausti-Sintes, F. (2015). Tourism: Economic growth, employment and Dutch disease. *Annals of Tourism Research*, 54, 172-189.
Inchausti-Sintes, F. (2019). A tourism growth model. *Tourism Economics*, 1354816619840096.

International Monetary Fund (*Staff Papers*). (1969). A theory of demand for products distinguished by place of production (16(1), 159-178). Washington DC, US: Armington, P., S.

International Monetary Fund. (2012). *Economic diversification in LICs: Stylized facts and macroeconomic implications* (No. 12-13). Washington DC, US: Papageorgiou, C., & Spatafora, M. N.

Jarreau, J., & Poncet, S. (2012). Export sophistication and economic growth: Evidence from China. *Journal of development Economics*, 97 (2), 281-292.

Law 19/2003, de 14 de abril, por la que se aprueban las Directrices de Ordenación General y las Directrices de Ordenación del Turismo de Canarias. [General Management Guidelines and the Canarian Tourism Management Guidelines]. Retrieved from: https://www.boe.es/buscar/pdf/2003/BOE-A-2003-13621-consolidado.pdf

Law 2/2013, de 29 de mayo, de protección y uso sostenible del litoral y de modificación de la Ley 22/1988, de 28 de julio, de Costas. [protection and sustainable use of the coast and modification of Law 22/1988, of July 28, of Coasts]. Retreived from: https://www.boe.es/eli/es/l/2013/05/29/2/dof/spa/pdf

Law 6/2009, de 6 de mayo, de medidas urgentes en materia de ordenación territorial para la dinamización sectorial y la ordenación del turismo. [Urgent measures in matters of spatial planning for sector dynamization and the management of tourism]. Retrieved from: https://www.boe.es/buscar/pdf/2009/BOE-A-2009-9047-consolidado.pdf

Lukashina, N., Amirkhanov, M., Anisimov, V., & Trunev, A. (1996). Tourism and environmental degradation in Sochi, Russia. *Annals of Tourism Research*, 23 (3), 654–665.

Millares-i-García, J. (2016). Green infrastructure on the Mediterranean Valencian Coast. *International Journal of Sustainable Development and Planning*. 11(3), 227–235.

Montero, C. (2011). Treinta hoteles de la Costa del Sol echarán el cierre durante el invierno [30 hotels from the Costa del Sol will close during the Winter season]. Retrieved from: https://www.elmundo.es/elmundo/2011/10/31/andalucia_malaga/1320062108.html

Njoya, E. T., & Seetaram, N. (2018). Tourism contribution to poverty alleviation in Kenya: A dynamic computable general equilibrium analysis. *Journal of travel research*, 57(4), 513-524.

Nowak, J. J., & Sahli, M. (2007). Coastal tourism and 'Dutch disease'in a small island economy. *Tourism Economics*, 13(1), 49-65.

Palmer, T., & Riera, A. (2003). Tourism and environmental taxes. With special reference to the "Balearic ecotax." *Tourism Management*, 24(6), 665-674.

Parreño-Castellano J., González-Morales, A., & Hernández-Luis, J. (2018). La (des)regulación territorial del crecimiento del alojamiento turístico. El ejemplo de Lanzarote, Islas Canarias (1991-2008) [The territorial (de)regulation of the growth in tourism accommodation: a case study of Lanzarote, Canary Islands (1991-2008)]. *Ciudad y Territorio* 195, 53-70.

Pintassilgo, P., & Silva, J. (2007). "Tragedy of the commons" in the tourism accommodation industry. *Tourism Economics*, 13(2), 209-224.

Pratt, S. (2014). A general equilibrium analysis of the economic impact of a devaluation on tourism: The case of Fiji. *Tourism Economics*, 20(2), 389-405.

Qu, H., Xu, P., & Tan A. (2002). A simultaneous equations model of the hotel room supply and demand in Hong Kong. *International Journal of Hospitality Management* 21, 455–462.

Rodríguez, M. (2014). La moratoria turística en las Islas Canarias: asignaturas pendientes [The tourism moratorium in the Canary Islands: an unfinished business]. *Arquitectura, Ciudad y Entorno*, 9 (25), 467-492.

Rullán-Salamanca, O. (2010). Las políticas territoriales en las Islas Baleares [Territorial policies in the Balearic Islands]. *Cuadernos Geográficos*, 47 (2), 403-428.

Rutherford, T. F. (1999). Applied general equilibrium modeling with MPSGE as a GAMS subsystem: An overview of the modeling framework and syntax. *Computational Economics*, 14(1-2), 1-46.
Sami, B.A., & Mohamed, G. (2014). Determinants of tourism hotel profitability in Tunisia. *Tourism and Hospitality Research*, 14(4), 163-175.
Sharpley, R. (2003). Tourism, modernisation and development on the island of Cyprus: Challenges and policy responses. *Journal of Sustainable Tourism*, 11(2), 246-265.
Simancas-Cruz, M. (2015). *La moratoria turística de Canarias. La reconversión de un destino maduro desde la Ordenación del Territorio* [The tourist moratorium of the Canary Islands. The reconversion of a mature destiny]. San Cristóbal de La Laguna, Spain: Servicio de Publicaciones de la Universidad de La Laguna.
Song, H., Romilly, P., & Liu, X. (2000). An empirical study of outbound tourism demand in the UK. *Applied Economics*, 32(5), 611-624.
The National Bureau of Economic Research. (2001). *Productivity Growth and the New Economy* (No. w8096). Massachusetts, US: Nordhaus, W.D.
Untong, A., Ramos, V., Kaosa-Ard, M., & Rey-Maquieira, J. (2015). Tourism demand analysis of Chinese arrivals in Thailand. *Tourism Economics*, 21(6), 1221-1234.
Villar Rojas, F.J. (2009). La política turística en Canarias [Tourism policy in the Canary Islands]. In M.R. Simancas Cruz (Ed.). El impacto de la crisis en la econom_ıa canaria. Claves para el futuro (Vol. I, pp. 467-412). La Laguna: Real Sociedad Económica de Amigos del País deTenerife.
Wattanakuljarus, A., & Coxhead, I. (2008). Is tourism-based development good for the poor?: A general equilibrium analysis for Thailand. *Journal of Policy Modeling*, 30(6), 929-955.
Witt, S. F., & Martin, C. A. (1987). Econometric models for forecasting international tourism demand. *Journal of Travel Research*, 25(3), 23-30.